



# INSTRUCTION MANUAL

*Digi Crown*  
**i/o – pbb**

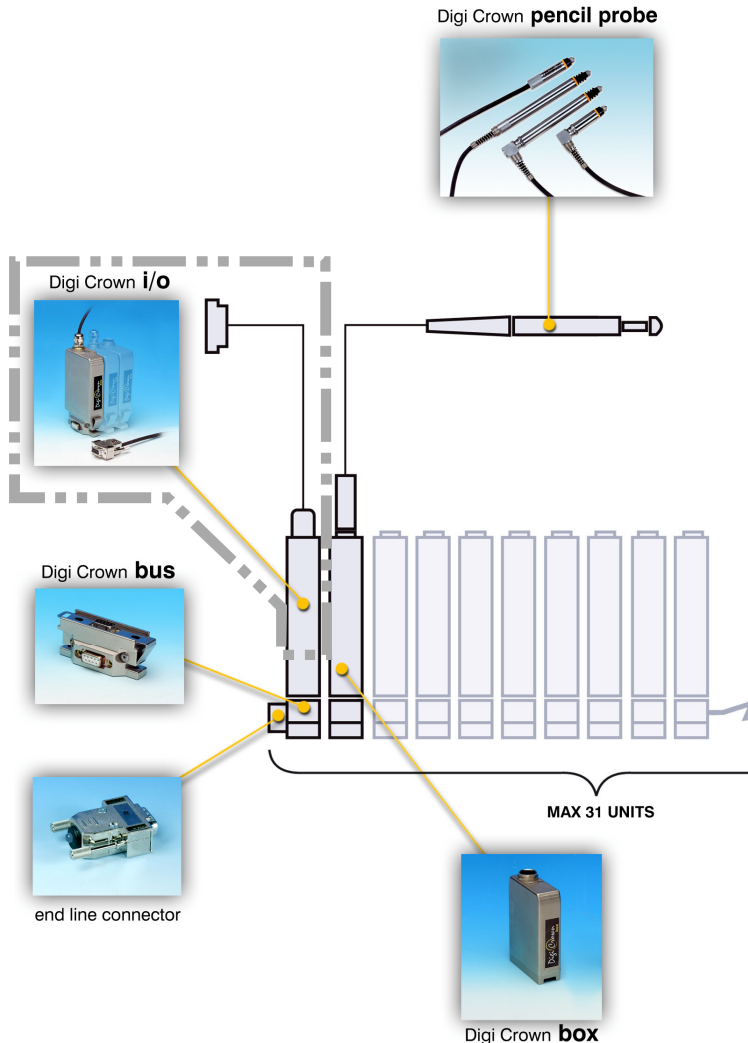
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# 1. "DIGICROWN PROBING LINE" SYSTEM INTRODUCTION

*DigiCrown* is a flexible measuring system (from 1 to 372 sensors) configured in networks (from 1 to 12), which can be connected to PCs using a RS232 serial/USB interface or RS485 dedicated interface cards for PCI or ISA BUS.

The diagram below shows the elements of the *DigiCrown* system in the possible configurations. This user manual provides in-depth information about operation of the *DigiCrown I/O* and *DigiCrown pbb* units.



Digi Crown **232 /USB**



**OPTION 2**  
RS 232 interf.



E9066 Line or  
Commercial PC



Digi Crown **psu**



Digi Crown **psc**

NET 1

**OPTION 1**  
RS 485 card

NET 1

NET 2

**MAX 6 CARDS**



Digi Crown **pci / isa**

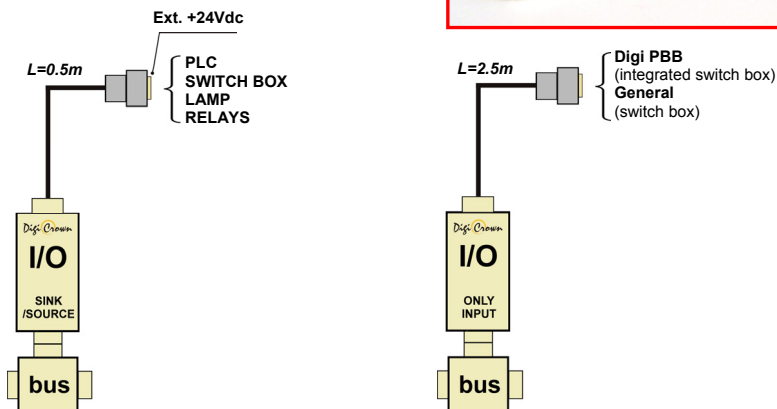
## 2. APPLICATION NOTES

The **I/O** module is used to manage digital input/output signals. Typical applications for this device are management of lamp indications, solenoid valves (through power relays) or acquisition of input signals by local cycle START/STOP push-button panels, limit switches, etc.

Each **I/O** module can manage any combination of up to a maximum of 8 digital inputs/outputs (e.g.: 4 inputs + 4 outputs, 2 inputs + 6 outputs, etc.), using a 15-pin D-sub connector.

The system limit is 32 **I/O** modules (total = 256 inputs/outputs).

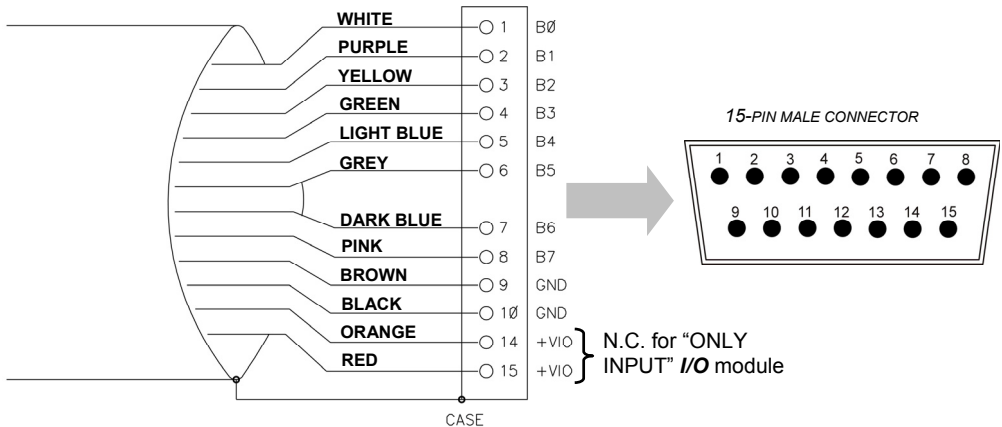
This device is available in **SINK**, **SOURCE** and **SINK ONLY INPUT** versions, to guarantee maximum flexibility for use according to the application to be managed.



The **I/O** module is mounted on the *DigiCrown* **bus** unit, which is used for communication with the data acquisition system with a standard RS-485 serial connection. A 9-pin D-sub connector is used for the connection to the **bus** module and also supplies electrical power to the control part and, in the case of the ONLY INPUT module, to the interface part.

Each **I/O** module also incorporates a LED for a rapid diagnosis of the unit's operating status (see section 5).

### 3. ELECTRICAL CONNECTIONS



Pins 1 - 8 of the 15-pin male D-sub connector are used to connect the *I/O* module to external signals.

Pins 9 - 10 and 14 - 15 are used to supply the 24V dc to the interface part. The electrical power supply is divided over four pins to guarantee an optimum current flow. To avoid overloads on the wires the 24V dc must be wired on all four pins.

**Note:** the power supply voltage on the 15-pin D-sub connector must be of the **SELV** type and isolated from the bus voltage.


For the "ONLY INPUT" *I/O* module the electrical connections are the same, except there is no 24V dc power supply. Therefore, pins 14 and 15 are not connected.

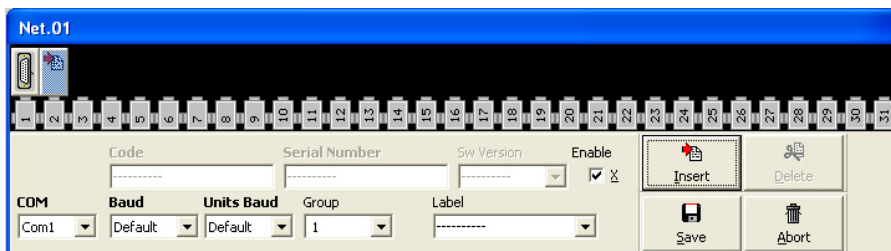
## 4. INPUT/OUTPUT CONFIGURATION

To configure the inputs/outputs on the DigiCrown **I/O** module you must install one of the following pieces of software: *QSPC*, *Easy Acquisition* or *Marposs Driver Library*.

Below are the basic steps for **I/O** module set-up. For further information about the MDHQSPC driver, consult manual **D29499006I** available on our web site: [www.testar.com](http://www.testar.com).

### 4.1. Off-Line Mode

1. Create a new NET by selecting the type of interface with the management PC: **isa**, **pci** card or **232/USB** module.
2. Select the **I/O** unit by clicking on the relative button , and press "Insert" to insert the **I/O** modules present in the NET.



3. Finally, press "Save" to save the current NET, and "Apply" to activate the configuration.

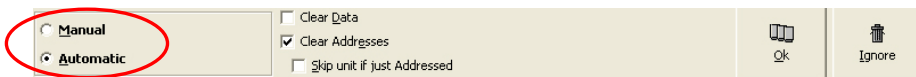


## 4.2. Addressing mode

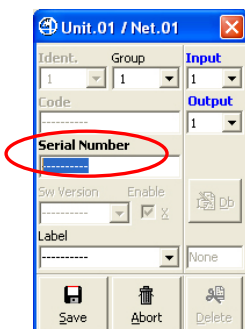
1. Click on the “Addressing ON/OFF” button (  ).

2. Press “OK” → 

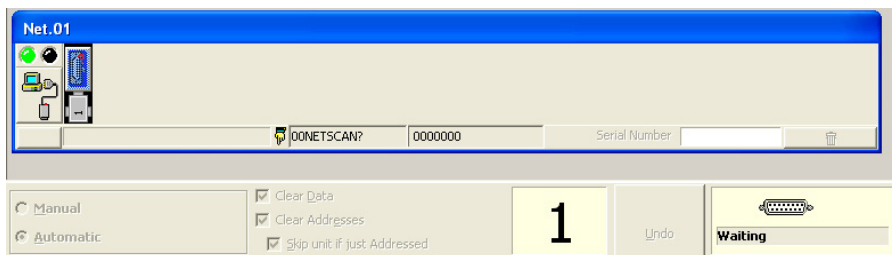
*N.B.: the addressing procedure for the I/O modules is the same in both “Automatic” and “Manual” modes.*




3. Type in the serial number of the I/O module and press “Save”.



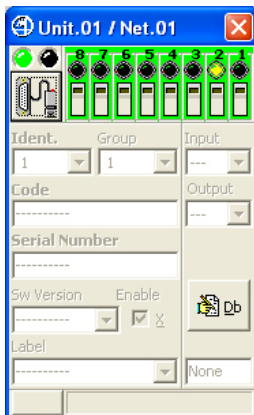
4. Alternatively, you can set the address for the module by physically changing the status of an input; usually: press a cycle START/STOP button, activate a limit switch contact, etc.



### 4.3. On-line Mode

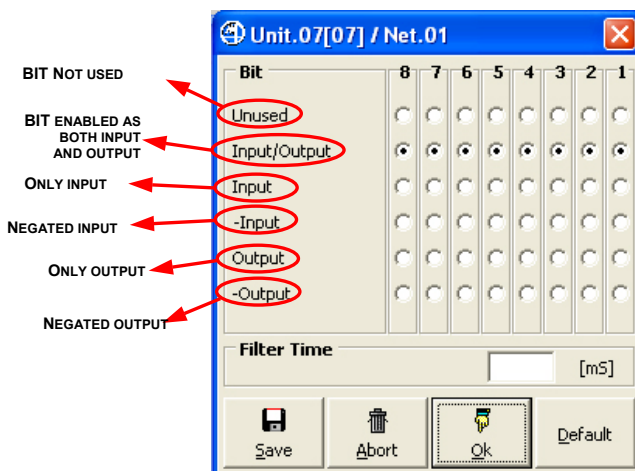
1. Go to the *on-line* step by clicking on this button: 



2. Open the window below by clicking on the first *I/O* module to be configured:



3. Press the “Db” button: 

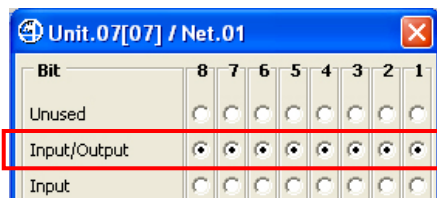
4. Configure the *I/O* module’s digital inputs/outputs using the window shown below. By default all bits are enabled as “Input/Output”.



5. Press  to save the settings to the **I/O** module memory.
6. Finally, close the window by pressing: 
7. Repeat steps 2 to 6 for all of the other **I/O** modules in the NET.

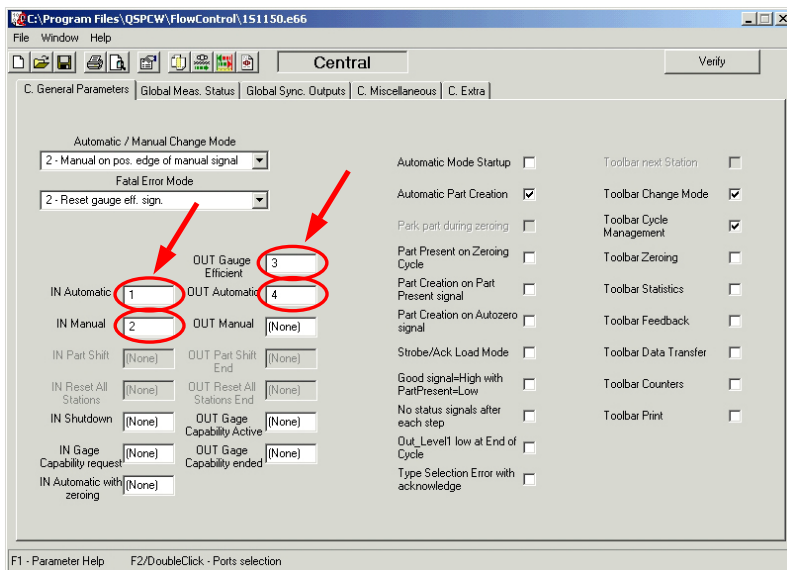
## 4.4. Flow-Control Application

The digital input/output driver interfaces with the Marposs data processing software (QSPC, *Easy Acquisition*...) using the **Flow-Control** application. This application allows a specific function to be associated with each digital signal arriving from the **I/O** module. To avoid conflicts with the DigiCrown **I/O** module configuration driver, set each bit to “Input/Output” (see image below).



In this way assignment of the digital inputs/outputs of each bit will be managed completely by the *Flow-Control* application (see example below). If there are two or more modules in the NET, the bits are numbered sequentially: module 1 (bits 1 - 8), module 2 (bits 9 - 16), module 3 (bits 17 - 24), etc.

For in-depth information about the *Flow-Control Environment* consult manual **D294072371**.



## 5. APPLICATION NOTES DIGI “PBB” PUSH BUTTON

The *DigiCrown pbb* push button implements the *I/O* unit, allowing to control eight digital inputs by means of ON/OFF buttons and a four positions selector.

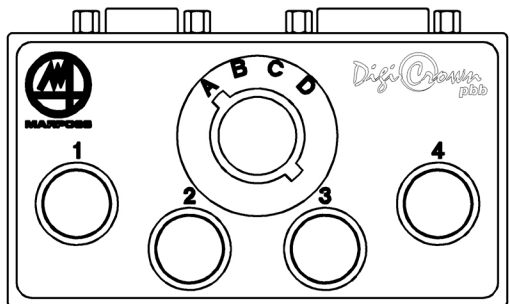
Typically the buttons are used for START/STOP sequences and data acquisitions, while the selector for setting a different working piece to be measured.

Besides the 15-pin female D-sub port used for connecting the *I/O* (ONLY INPUT) module, the push button includes a 9-pin female connector for linking an external footswitch.



It follows the frontal view of the *Digi pbb* push button with the relevant digital bit associated to each switch.

- Button 1 = *bit 0*
- Button 2 = *bit 1*
- Button 3 = *bit 2*
- Button 4 = *bit 3*
- Selector position A = *bit 7*
- Selector position B = *bit 6*
- Selector position C = *bit 5*
- Selector position D = *bit 4* (\*)



(\*) The bit 4 reserved to the “D” position of the selector, it’s automatically assigned to the footswitch by unscrewing the 9-pin male connector.

The following MARPOSS footswitches are compatible with the push button:

- Quick Read footswitch (code **6738099030**)
- E4N footswitch (code **6738099015**)
- E9066 footswitch (code **6131600810**) – the adapter (code **4701300042**) is required.

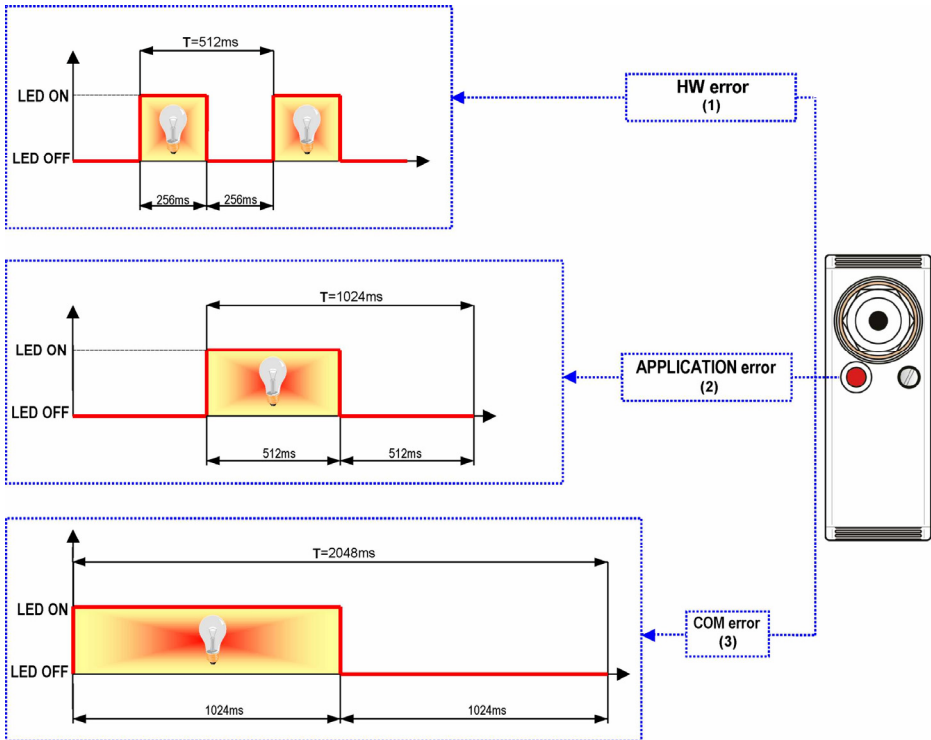
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## 6. UNIT OPERATING STATUS LED

The type of light indication by the red LED on the **I/O** module indicates the unit operating status. LED flashing modes are as follows:

- “ON ERROR” (*LED is only activated when an error is generated – sec. 5.1*)
- “AUTOMATIC” (*mode which includes both ON ERROR indication and brief flashes to indicate network sessions pending – sec. 5.2*).

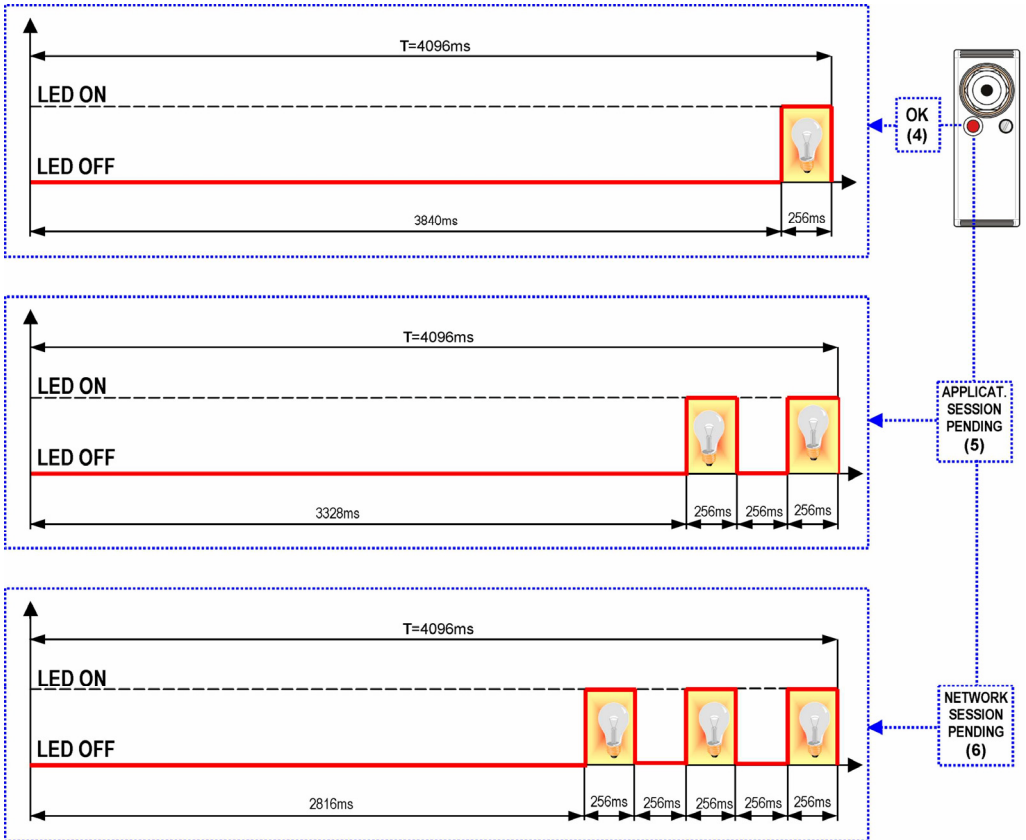
## 6.1. “ON ERROR” or “AUTOMATIC” Modes



### Notes:

- (1) HW ERROR → general hardware and *bootstrap* errors
- (2) APPLICATION ERROR → specific *I/O* errors
- (3) COM ERROR → error in RS-485 serial communication

## 6.2. “AUTOMATIC” Mode



### Notes:

(4) OK → optimum network operation

(5) APPLICATION SESSION PENDING → specific *I/O* errors

(6) NETWORK SESSION PENDING → identification session for various network components



## 7. GROUND CONNECTION

In this chapter are reported different technical solutions in order to make sure the *DigiCrown* system is properly grounded, according to the NET's configuration and to the lay-out of the different units.

**The purpose of ground connection is to minimize as much as possible the electrical noise and the interference, typically affecting the measurement signal.**

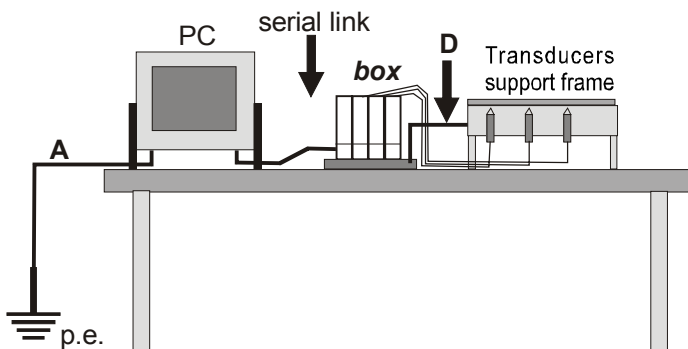
The ground connections schemes reported in this paragraph represent the optimal solution in order to have a system fully compatible with the EMC standards, according to the following directives:

- 73/23/EEC
- 2004/108/CE
- EN55022: 1998 (EMC)
- EN55024: 1998 (EMC)

If for a specific application the customer considers such technical solutions not required, Marposs is not responsible for any possible inaccurate working condition of the devices.

### • **Bench application n. 1**

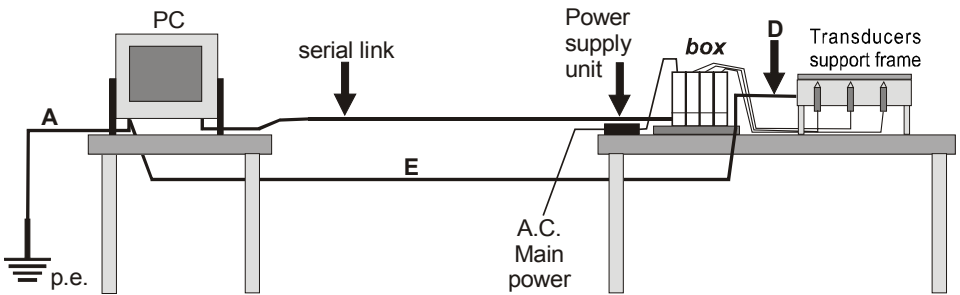
The whole *DigiCrown* system (control + measurement) has been placed on a single bench gauge.



The “D” equipotential connection between the **box** modules and the transducers support frame, can be done whether a metallic conductive frame is used. In the glass gauging applications the transducers support frame is usually not a conductive material and the transducers are typically insulated, in this case no ground connection is required.

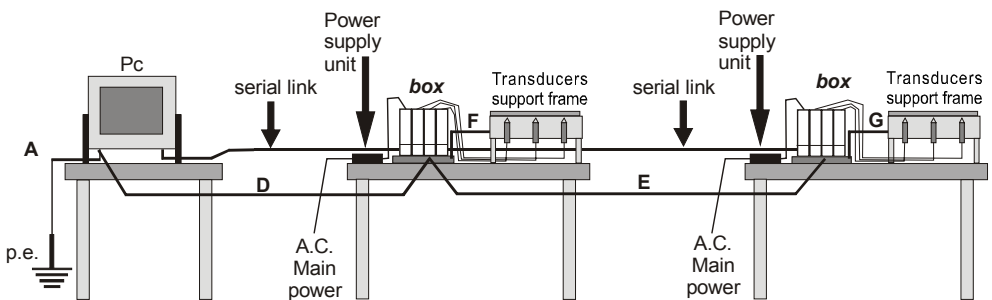
- **Bench application n. 2**

In case the control system (PC...) is placed on a bench while the transducers and the **box** modules on another, we suggest to set-up an equipotential link as shown in the points: **A + D + E**.



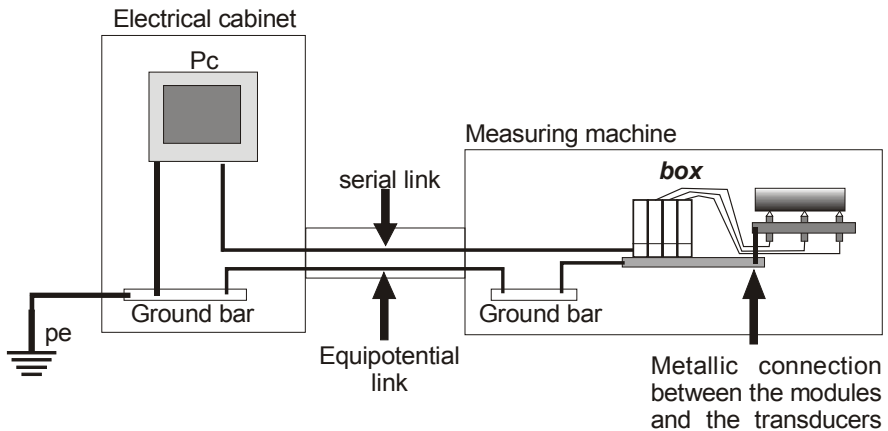
- **Bench application n. 3**

If the *DigiCrown* system is split on two or more benches, we suggest to set-up an equipotential link as shown in the points: **A + D + E + F + G**.



- **Automatic machine application**

For such applications it is strongly suggested to provide the **box** units and the transducers support frame with an equipotential link: in the automatic machine applications the eddy-currents normally flow in the transducer's shield.



## 8. TECHNICAL SPECIFICATIONS

### *DigiCrown I/O (SINK version) / code 767I000000*

<b>Power supply (bus)</b> .....	+7.5V dc (-10% + 30%)
<b>Current absorption (bus)</b> .....	40mA
<b>Power supply (V I/O)</b> .....	24V dc ( $\pm 20\%$ )
<b>Current absorption (I/O)</b> .....	15mA (no output active)
<b>I/O size</b> .....	8 input and/or output bits, optoisolated, individually selectable
<b>Input specifications</b> .....	Voff (min): V I/O - 5V; Von (max): V I/O - 15V
<b>OUT capacity</b> .....	200mA (per OUT) - outputs total max. current: 800mA ( <i>temp.</i> = 0 to +50°C) - outputs total max. current: 700mA ( <i>temp.</i> = 0 to +60°C)
<b>I/O protection</b> .....	power supply inversion, output overload
<b>Dimensions</b> .....	see section 5

### *DigiCrown I/O (SOURCE version) / code 767I010000*

<b>Power supply (bus)</b> .....	+7.5V dc (-10% + 30%)
<b>Current absorption (bus)</b> .....	40mA
<b>Power supply (V I/O)</b> .....	24V dc ( $\pm 20\%$ )
<b>Current absorption (I/O)</b> .....	25mA (no output active)
<b>I/O size</b> .....	8 input and/or output bits, optoisolated, individually selectable
<b>Input specifications</b> .....	Voff (max): 5V; Von (min): 15V
<b>OUT capacity</b> .....	200mA (per OUT) - outputs total max. current: 800mA ( <i>temp.</i> = 0 to +50°C) - outputs total max. current: 700mA ( <i>temp.</i> = 0 to +60°C)
<b>I/O protection</b> .....	power supply inversion, output overload
<b>Dimensions</b> .....	see section 5

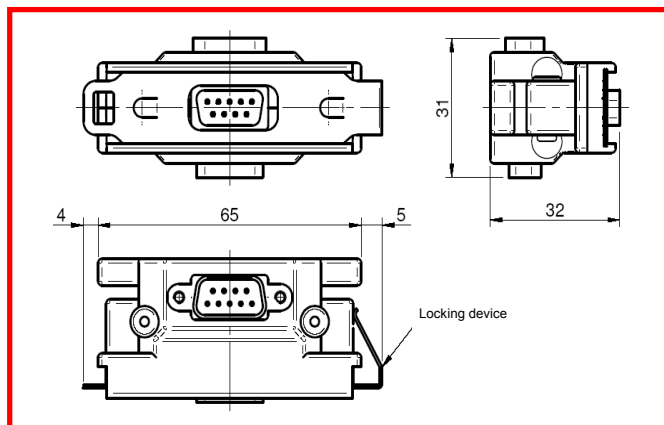
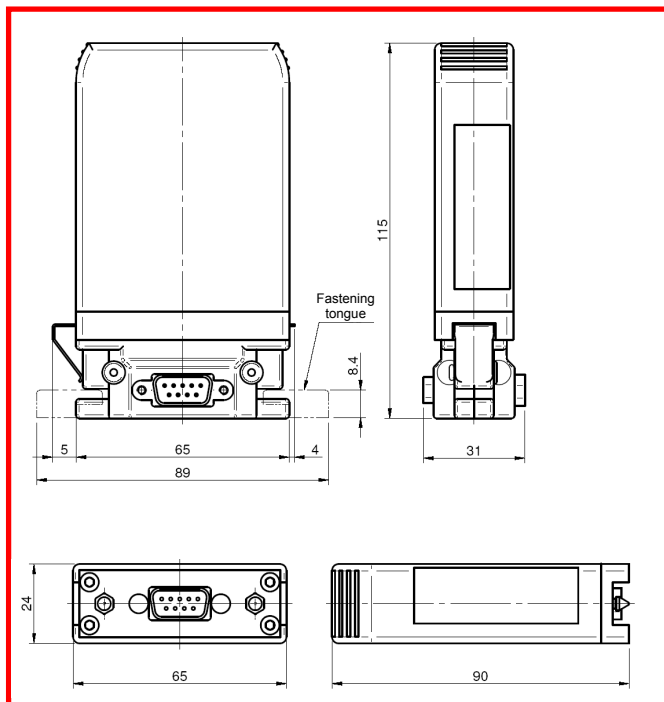
### *DigiCrown I/O (ONLY INPUT version) / code 767I020000*

<b>Power supply (bus)</b> .....	+7.5V dc (-10% + 30%)
<b>Current absorption (bus)</b> .....	50mA (all inputs activated)
<b>I/O size</b> .....	8 input bits (not isolated)
<b>Input specifications</b> .....	OFF: Rswitch > 500 K $\Omega$ ON: Rswitch < 3300 $\Omega$
<b>Dimensions</b> .....	see section 5

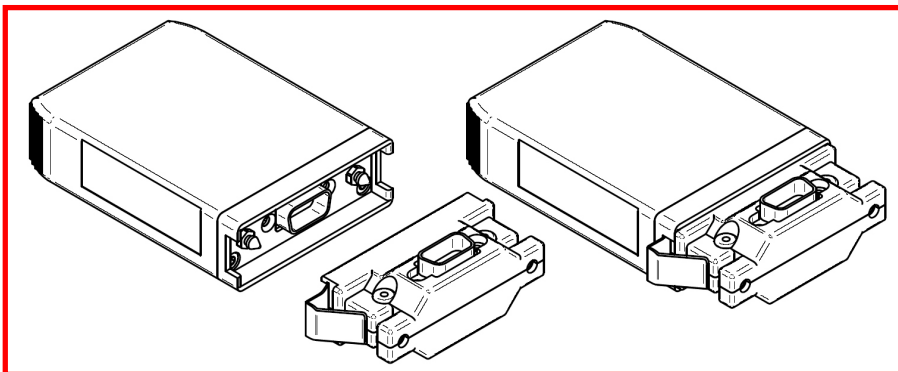
**CAUTION!!**  
**Use a SELV power source**  
**(as defined by EN60950)**

## 9. INSTALLATION DRAWINGS

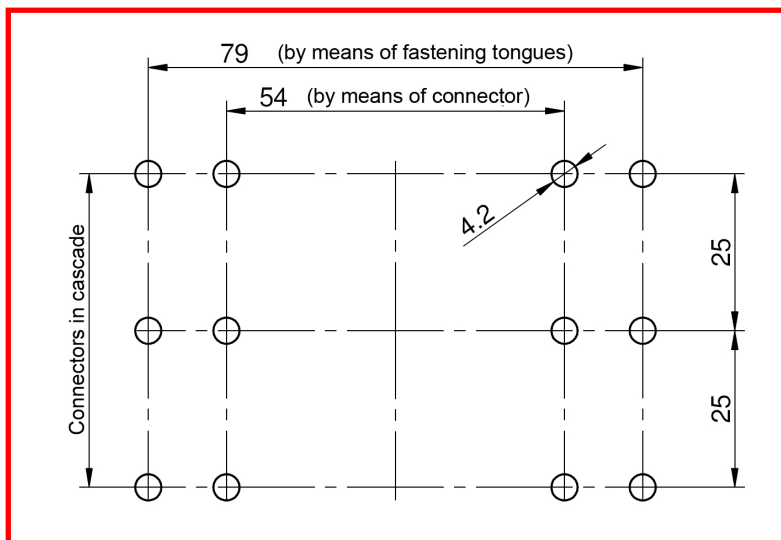
### *I/O module*



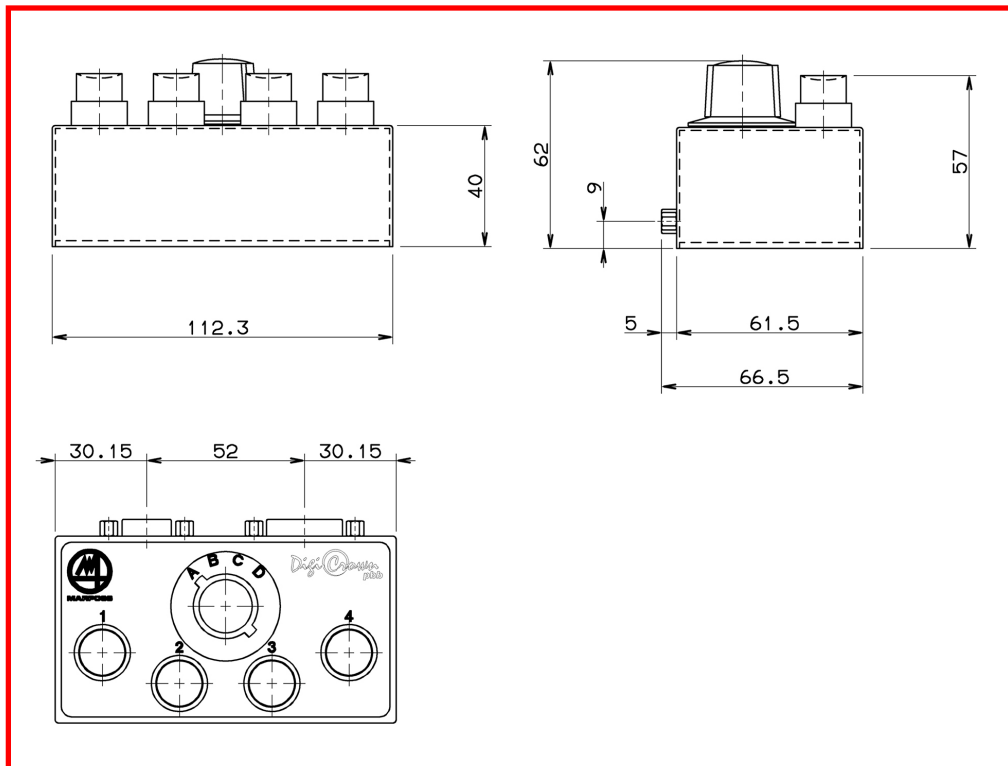
### Hooking of I/O module to **bus** connector



### Dimensions of fastening to stand



## 9.1. Dimensional drawings *Digi PBB* unit



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## 10. DECLARATION OF CONFORMITY

MARPOSS S.p.A. hereby declares that the devices referred to in this manual conform to **CE** safety requirements and EMC electromagnetic compatibility requirements, in accordance with the following directives:

**73/23/EEC** of 19-02-1973 (LOW VOLTAGE directive)

**2004/108/EC** of 20-01-2005 (EMC directive)

The apparatuses were designed, assembled and tested in conformity with the following European standards:

**EN60950: 2000** (Safety)

**EN61326 - 1: 1997** (EMC)

**EN61326/A1: 1998** (EMC)



## 11. ORDER CODES

The tables below provide a summary of the order codes for all components in the DigiCrown Probing Line.

The parts highlighted relate to elements referred to in this manual.

### INTERFACES

ORDER CODE	DESCRIPTION
767X000000	DIGI CROWN BOX
767X000200	DIGI CROWN BOX + RAM
767Y000000	DIGI CROWN 232
767Y010000	DIGI CROWN USB
767W000000	DIGI CROWN PSU (110-240Vac / 7,5Vdc)
767W010000	DIGI CROWN PSU (24Vdc / 7,5Vdc)
767I000000	DIGI CROWN I/O SINK
767I010000	DIGI CROWN I/O SOURCE
767I020000	DIGI CROWN I/O ONLY INPUT
6139013200	DIGI CROWN PBB
6355321000	DIGI CROWN PCI
6355322000	DIGI CROWN ISA

### EXTENSIONS

ORDER CODE	DESCRIPTION
6738057016	CONNECTION CABLE 2m
6738057023	CONNECTION CABLE 10m
6738057022	CONNECTION CABLE 15m
6738057017	CONNECTION CABLE 25m

### ACCESSORIES


ORDER CODE	DESCRIPTION
6355200000	END LINE CONNECTOR
6872030010	DIGI CROWN BUS
6872030011	DIGI CROWN PSC
4147000013	EU PLUG
4147000014	USA PLUG
4147000015	UK PLUG
4147000016	EU CABLE
4147000017	USA CABLE

### SW packages

ORDER CODE	DESCRIPTION
CM2Z22MA00	QSPC
CM2F22MA02	EASY ACQUISITION
CM2A12MA01	MARPOSS DRIVER LIBRARY

## This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper appears to be a standard notebook page or a sheet of stationery.

[illegible]

 2002/95/EC 2002/96/EC	<p>This product and any part which can be mechanically separated from it must not be dispersed to the environment or disposed of as municipal or generic waste (Law for national adoption of European directives 2002/95/EC and 2002/96/EC and others). The provisions of the law only apply to products identified as WEEE with the appropriate logo and on sale since 13 August 2005. WEEE products, once decommissioned, may contain substances and parts which are harmful to people and the environment and which must undergo professional treatment to allow their re-use, recycling and definitive disposal. Deliver WEEE products to an authorised WEEE treatment centre, or contact the local body in charge of such services or the nearest Marposs support centre for information. Illegal disposal of WEEE products is an offence which will be punished by law.</p>
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**A full, up-to-date list of addresses is available at the official Marposs web site: [www.marposs.com](http://www.marposs.com) - [www.testar.com](http://www.testar.com)**

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